

CLAIMS

1. A differential load driving circuit comprising:
 - a plurality of power switches selectively coupled to a load to supply current to said load;
 - a plurality of power switch driving circuits operable to control the conduction state of said power switches and to selectively couple at least one of said plurality of power switches to a PWM signal; and
 - at least one current source;
 - wherein said current source is coupled to said load to deliver current to said load during low current conditions at said load, and said PWM signal coupled to said load to deliver current to said load during high current conditions at said load.
2. A differential load driving circuit as claimed in claim 1, said plurality of power switches forming an H-Bridge differential load driving circuit.
3. A differential load driving circuit as claimed in claim 1, further comprising two current sources, wherein one said current source being coupled to said load during a first low current time period and the other said current source being coupled to said load during a second low current time period.
4. An H-Bridge load driving circuit, comprising:
 - four power switches forming an H-Bridge circuit selectively coupled to a load to supply current to said load;
 - a plurality of power switch driving circuits operable to control the conduction state of said power switches and to selectively couple at least two of said plurality of power switches to a PWM signal; and
 - at least one current source;

1 wherein said H-Bridge circuit having a first mode in which said current source is coupled
2 to said load to supply current to said load and a second mode in which at least two of said power
3 switches are coupled to said PWM signal to supply current to said load.

4 5. An H-Bridge load driving circuit as claimed in claim 4, said first mode is a low current
5 mode and said current source supplies a linear current to said load.

6 6. An H-Bridge load driving circuit as claimed in claim 4, said second mode is a high
7 current mode.

8 7. An H-Bridge load driving circuit, comprising four power switches forming an H-Bridge
9 circuit selectively coupled to a load to supply current to said load; and at least one current
10 source; wherein said H-Bridge circuit is adapted to operate in a linear mode using said current
11 source and a PWM mode wherein said switches are controlled with a PWM signal.

12 8. An H-Bridge load driving circuit as claimed in claim 7, further comprising a plurality of
13 power switch driving circuits operable to control the conduction state of said power switches and
14 to selectively couple at least two of said plurality of power switches to a PWM signal.

15 9. An H-Bridge load driving circuit as claimed in claim 7, further comprising at least one
16 filter circuit coupled between at least two of said four power switches and said load.

17 10. An H-Bridge load driving circuit as claimed in claim 7, said load comprises a thermal
18 electrical cooler.

19 11. A differential driving circuit for driving a thermal electric cooler, said circuit comprising:
20 a plurality of power switches selectively coupled to a thermal electric cooler load to
21 supply current to said load;

1 a plurality of power switch driving circuits operable to control the conduction state of
2 said power switches and to selectively couple at least one of said plurality of power switches to a
3 PWM signal; and

4 at least one current source;

5 wherein said differential driving circuit having a first mode in which said current source
6 is coupled to said load to supply current to said load and a second mode in which at least two of
7 said power switches are coupled to said PWM signal to supply current to said load.

8 12. A differential driving circuit as claimed in claim 11, said plurality of power switches
9 forming an H-Bridge differential load driving circuit.

10 13. A differential driving circuit as claimed in claim 11, said first mode comprising a low
11 current mode in which the direction of current through the load defines a cooling mode.

12 14. A differential driving circuit as claimed in claim 11, said first mode comprising a low
13 current mode in which the direction of current through the load defines a heating mode.

14 15. A differential driving circuit as claimed in claim 11, said first mode comprising a high
15 current mode in which the direction of current through the load defines a cooling mode.

16 16. A differential driving circuit as claimed in claim 11, said second mode comprising a high
17 current mode in which the direction of current through the load defines a heating mode.